

Response
Application No. 10/669,713
Attorney Docket No. 031212

REMARKS

Claims 1-5 are pending in the application.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 3-5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Hamrock** (U.S. Patent 6,063,522) in view of **Sano** (U.S. Application Publication 2002/0086191); and claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over **Hamrock** in view of **Sano**, and further in view of **Takahashi** (JP 2003-249263). Applicants note that Takahashi corresponds with U.S. Patent Application Publication 2003-162100A1.

Favorable reconsideration is requested.

Applicants respectfully submit that Hamrock in view of Sano does not disclose “the main component being 90% to 100% by volume of the total volume of the non-aqueous solvent” as recited in amended claim 1.

Hamrock as a whole does not suggest using diethylene glycol dimethyl ether (“DGM”) at 90 to 100 % by volume of the total volume of the solvent. DGM is disclosed in the present specification as satisfying the requirements of formula 1 in claim 1. (Specification, page 7, lines 14-17.) Hamrock discloses that DGM is one suitable aprotic liquid in a list of many compounds, for use in a battery. (Col. 13, line 52 to col. 14, line 9.) However, specific examples 1-13 all disclose using 50/50 blends of solvents, none of which meet the requirements of claim 1. (See e.g., col. 15, lines 14-18; col. 20, lines 52-58.) Since Hamrock discloses that DGM is one solvent that can be used in a list of many solvents, and in all the specific examples, 50/50 blends

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of solvents are used, Hamrock taken as a whole would suggest at most using DGM in a 50/50 blend of solvents. Hamrock does not disclose using a “main component” as recited in claim 1 and “being 90% to 100% by volume of the total volume of the non-aqueous solvent.” Therefore, Hamrock in view of Sano does not disclose the elements as recited in claim 1.

Applicants respectfully submit that unexpected results are achieved when using a solvent having a “main component” as recited in claim 1 and the main component being 90 to 100% by volume of the solvent.

The unexpected results of using a volume ratio of the compound represented by general formula (1) as higher than or equal to 90 % and lower than or equal to 100 % produces a cell that has no abnormality in high temperature preservation tests and reflow resistance tests, restricts cell swelling in reflow resistance tests to 0.15-1.40 %, and excels in discharging characteristics such that the relative discharging capacity is 82-103 %. (See Table 2.) As can be seen from Table 2, poor results are obtained when the main component is as low as 70 % in the solvent. (Comparative Example 5.)

In addition, the present specification describes the results of using DME alone (comparative example 1) and the use of PC alone (comparative example 2). Both of these examples show cell abnormality in high temperature preservation tests and reflow resistance tests. (Specification, page 12, line 15 to page 13, line 14.) Use of a solvent having PC and DME mixed at a volume ratio of 50:50, as disclosed in Hamrock, would likewise result in cell abnormality in high temperature preservation tests and reflow resistance tests.

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Since the present invention achieves unexpected results as demonstrated in the specification, the present invention is non-obvious over Hamrock in view of Sano.

Applicants respectfully submit one of ordinary skill in the art at the time of the present invention would not have been motivated to combine Hamrock and Sano.

Hamrock discloses a lithium cell; however, Hamrock does not disclose high temperature applications of a lithium cell. Sano discloses a heat-resistant separator. One of ordinary skill in the art would not have a need to use a heat resistant separator in a lithium cell that is not disclosed as being applied in high temperature environments. Since one of ordinary skill in the art would not have been motivated to combine Hamrock and Sano, the present invention is non-obvious over Hamrock in view of Sano.

For at least the foregoing reasons, claim 1 is patentable over the cited references, and claims 2-5 are patentable by virtue of their dependence from claim 1.

Accordingly, withdrawal of the rejections of claims 1-5 under 35 U.S.C. § 103 is hereby solicited.

Claim Rejections – Double Patenting

Claims 1-3 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 4-6 of copending Applications 10/787,749 and 10/785,970.

Applicants will address the provisional rejection for obviousness-type double patenting once all other claim rejections have been withdrawn.

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In view of the above remarks, Applicants submit that the claims are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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